

The Imperial Mind and Biodiversity Conservation: Historical perspective on current debates in biodiversity conservation¹

Angus Wright ²

ABSTRACT

Biodiversity conservation debates have recently been summarized in the phrase, “land-sparing versus land-sharing.” In the land sparing camp are those who seek policies to put as much of the earth’s surface as possible into “protected areas” in which agriculture would be virtually excluded. In order to assure adequate food production, land outside protected areas would be farmed with maximum intensity through techniques that would largely exclude or exterminate wild populations of flora and fauna. In contrast, those who advocate land sharing policies argue for a combination of protected areas alongside agricultural landscapes that would use techniques tending to favor the maintenance of wild populations within a complex matrix of land uses.

Here, I contend that the attempt to settle the debate through studies that seek quantification of agricultural production data and promotion of wild species populations in existing landscapes uses is of limited value because of the inability to control properly for both temporal and spatial variation. The more fundamental problem in quantitative evaluation, the one explored at length in this paper, is that the two policy positions in fact disguise profoundly different philosophical world views that can best be understood through historical analysis of the formation of colonial and post-colonial conservation ideas and practice. I argue that the essential problem with the land-sparing perspective can be summarized in two related points: first, land-sparing strategies assume that protected areas are more protective of a broad range of species than they are; and, second, they assume that the negative effect of industrial agriculture on biodiversity is minimal and can remain so even under strategies to increase production on a smaller land base. Both of these assumptions rest on a historically derived idea of control over landscape and habitat processes that is, from the land-sharing perspective, illusory. This false sense of control over human life and ecological processes arises at least partially from a way of thinking shaped by imperialism. I lay out here a historical perspective on contemporary conservation policy debates, with emphasis on the development of conservation policy in Brazil, Meso-America, and the United States.

Keywords: Biodiversity; Conservation; Environmental History; Farming.

¹ This work has been part of the preparation of the second edition of *Nature’s Matrix: Linking Conservation, Agriculture, and Food Sovereignty*, Routledge, co-authored with Ivette Perfecto and John Vandermeer

² Professor Emeritus of Environmental Studies, California State University, Sacramento. ORCID: <http://orcid.org/0000-0001-6857-5025>. wrighta@csus.edu

E. O. Wilson, one of the world's best-known biologists, has recently proposed that half of the earth's surface should be put into protected status for the purpose of preserving protected areas. While his proposal is unusually bold, the general idea of a vast expansion of protected areas is common among conservationists in the United States and elsewhere. At present, something less than fifteen percent of planetary surface is in some kind of protected status, with various international agencies committed to expanding protected areas to seventeen percent. Implementation of what Wilson calls a "Half-Earth" strategy would require that more than three times as much land than at present be designated as "protected" areas for the primary purpose of biodiversity protection³.

Wilson imagines that a Half-Earth approach would require a much further intensification of agricultural production on land outside protected areas in order to provide enough food for human needs. He does little to contemplate what kind of intensification would be required nor does he analyze the consequences of such intensification for biodiversity either within or outside agriculturally productive areas. Since he relies on previous production gains under industrial agriculture intensification as evidence of the possibility of greater gains using similar techniques, he apparently does not see any serious drawbacks to such techniques. While he does not use the term, some conservationists who favor strategies similar to Wilson's proposal speak of agricultural land as "sacrifice zones," in which intensification making liberal use of pesticides and synthetic fertilizers and other cultivation techniques would necessarily reduce non-food organisms to a bare minimum. (The term is apparently borrowed from the environmental justice discourse, in which "sacrifice zones" are places with high rates of pollution by toxic substances often inhabited by poor and minority communities.) In the growing scientific literature, Wilson's and similar perspectives have come to be called "land-sparing," with the idea that agricultural intensification must be used to spare as much land as possible from human activity in order to leave the rest for the flourishing of non-human species. Not surprisingly, those who support large-scale industrialized agriculture have joined

³ Edward O. Wilson, *Half-Earth: Our Planet's Fight for Life* (Norton: Liveright, 2016).

some elite-based conservation organizations in advocating directly or indirectly for such an approach.

In contrast to the land-sparing approach, others who are equally as interested in biodiversity conservation have proposed a “land-sharing” approach, in which it is argued that high food production and biodiversity conservation may best be achieved within highly complex landscape matrices. Such matrices include protected areas intended uniquely for species protection along with other areas that provide for species protection integrated with other land uses. Protected areas of various kinds are to be integrated with agricultural land that in both the distribution of crop production and the techniques used to achieve it are relatively favorable to the movement and reproduction of a wide range of species. This would require major changes in agricultural practices that rely heavily on synthetic fertilizers and pesticides and a variety of associated techniques which taken together are often termed industrial agriculture. These changes are, in this view, clearly necessitated by the evidence of surveys of biodiversity loss that hold agriculture, including agricultural technologies and habitat conversion for agriculture, to be the most important factor in global species loss⁴. (Among possible new practices would be the development and adoption of perennial grain and legumes mixtures to replace current reliance on annual monocrops—an approach pioneered by The Land Institute, whose development will be chronicled and analyzed by another paper on this panel authored by Donald Worster.)

In the version of land-sharing proposed by Perfecto, Vandermeer, and me, we propose that a healthy landscape matrix favorable to biodiversity can only be achieved by an alliance of diverse social movements and organizations. In the United States and other temperate-zone nations, there are a variety of organizations that implicitly or explicitly favor a land-sharing perspective, including most environmental organizations. Among the most important are land trust organizations that sign contracts with landowners to create or maintain agriculture that is supportive of relatively high species diversity, migration, and survival. Organizations bringing

⁴ cf. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, “Nature’s Dangerous Decline, Unprecedented Species Extinction Rates Accelerating.” May, 2019.

together practitioners and researchers of organic agriculture, permaculture, rotational grazing, and perennial grain and legume production all usually favor species friendly production techniques. In Europe, and to a lesser degree in the United States, governments offer cash payments or other reimbursements to farmers who adopt production plans that directly and indirectly favor wildlife⁵.

These initiatives are complemented in many urban areas by planning for parks, parkways, and greenbelts that offer wildlife-friendly areas within urban boundaries, and in the best of circumstances, connect urban landscapes directly to wildlife friendly agriculture.

In the biodiverse tropics, support for wildlife-friendly landscape matrices include organizations of those who are already practicing species-friendly agriculture, such as those cultivating shade grown coffee and cacao. These organizations are supported by trade certification schemes for “shade grown” and “bird friendly” products. In Asia, there are smallholder rice systems which support high biodiversity, and organizations which represent these farmers. In Brazil and other countries the organizations include land reform movements, organizations of producers within specially designated extractive reserves, indigenous peoples, members of quilombos, and family farm confederations, most of which have officially adopted policies promoting agroecological farming techniques that tend to create high-quality, species-friendly landscape matrices. At the international level, the organization *Via Campesina*, an alliance of peasant and small-scale agricultural producers, promotes such approaches. There is a general recognition among such organizations that for a variety of reasons, their members often practice agriculture that tends to destroy or degrade species-rich environments, but that understanding strengthens the resolve to support positive change that, they believe, will tend to support more successful small-scale agricultural production as well as biodiverse landscape matrices. As in temperate zone countries, a substantial portion of the tropical environmental movement supports policies promoting agroecological approaches to agriculture that

⁵ Ivette Perfecto, John Vandermeer, and Angus Wright, *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*, 2nd ed. (London: Earthscan Publications Ltd., 2019).

promote complex landscape matrices friendly to high levels of biodiversity, although some of the movement is tending towards land-sparing approaches⁶.

ECOLOGICAL THEORY AND THE LIMITATIONS OF PROTECTED AREAS

Recently developed ecological theory uses a mathematically sophisticated analysis of patterns of species extinction to show that localized extinctions of species occur regularly even in the most protected of landscapes, and that what ultimately determines species survival is whether landscape uses outside of protected areas allow and encourage species migration and reproduction across their entire ecologically suitable range. Protected areas are very seldom large enough to provide conditions for the survival of most species without the support of species-friendly landscapes that surround and connect protected areas. The opportunities for reproduction and migration offered within agricultural areas are critical for species survival, as is the existence of protected non-agricultural areas. It is this land-sharing position that my co-authors, Ivette Perfecto and John Vandermeer and I have argued in ***Nature's Matrix: Linking Conservation, Agriculture, and Food Sovereignty***, soon to appear in a second edition⁷.

RECENT DEVELOPMENTS IN THE DEBATE

When we published our first edition in 2009, these contrasting polar positions did not usually carry the specific land-sharing and land-sparing labels, and the positions were less sharply defined and argued. Since 2009, the perspectives have been more clearly defined and labeled, with a gain in clarity but perhaps a loss in subtlety and nuance. As Kremen commented in her meticulous review of the research,

...[the debate] limits the realm of future possibilities to two, largely undesirable options for conservation. Both large, protected regions and favorable surrounding matrices are needed...; they work synergistically and are not mutually exclusive. A “both-and” framing of large protected areas surrounded by a wildlife-friendly matrix suggests different research priorities from the “either-or” framing of sparing versus sharing. Furthermore, wildlife-friendly

⁶ Ibid.

⁷ Ibid., chap. 2.

farming methods such as agroecology may be best adapted to provide food for the world's hungry people⁸.

In spite of this very measured and reasonable effort in 2015 to put an end to an increasingly polarized debate, Wilson in 2016 and others proceeded to sharpen the idea of an “either-or” approach by vastly increasing the territorial ambitions of the land-sparing advocates while avoiding critical discussion of the damaging effects of industrial agriculture.

In any case, there is now a significant amount of research that attempts to empirically evaluate the comparative advantages and disadvantages of the two approaches. In spite of a proliferation of studies, there is no strong empirical comparative evidence capable of proving the superiority of one approach over others. There are a number of reasons for this lack of resolution, reasons that are fundamental to the nature of the problem and unlikely to be resolved. Disciplinary background, mindsets, loyalties, experience, and prejudices are likely to be more important in gaining adherents to one position or the other rather than an accumulation of academic comparative studies.

Time and space are the most fundamental problems in comparative studies. How long a time period is appropriate for evaluation of the two strategies, and for how long a period do we have consistent and reliable data? We have no clearly defined date at which the activities towards biodiversity conservation and agricultural production begin their long interactive relationship, because useful studies must begin with actually occurring landscapes, landscapes in which an intricate dance involving agriculture and species survival has a long history. We also have no idea of when we would be able to declare the dance to be over, so it is exceedingly difficult to set empirically appropriate beginnings and ends to studies. We may be able to measure species numbers at a given end date but knowing whether any given species is headed towards greater or lesser number is very difficult but essential⁹.

⁸ Claire Kremen, “Reframing the Land-Sparing/Land-Sharing Debate for Biodiversity Conservation,” *Annals of the New York Academy of Sciences* 1355, no. 1 (October 2015): 52–76, <https://doi.org/10.1111/nyas.12845>.

⁹ For a quick summary featuring major players, see: Fred Pearce, “Sparing vs Sharing: The Great Debate Over How to Protect Nature,” 2018, <https://e360.yale.edu/features/sparing-vs-sharing-the-great-debate-over-how-to-protect-nature>.

Similarly, if two such landscape level approaches are to be compared, where does one draw the boundary between one approach and the other? Most actually occurring landscapes may be seen to represent some kind of blend of the two strategies in ways that make it very difficult to compare because only an arbitrary spatial boundary can be determined, and yet, if none is determined, what should be measured? In addition, very few advocates of either position insist on a simple either/or dichotomy and are compelled to recognize that all regional landscapes are a mix. In contrast to Wilson's sharply arbitrary "half-earth" suggestion, most involved in the debate on both sides understand that it is a matter of emphasis rather than a question of choosing between polar opposites. Not surprisingly, a proliferation of carefully designed studies meant to compare sparing and sharing approaches have led to conclusions that add detail to understanding the problem but that fall short of final determinations of the superiority of one approach over the other. In practice, there is no clear solution to the problem of comparison, as a little thought reveals.

For a moment, let us consider the United States state of California. Wilson's measure is already met in the very large state of California, with more than fifty percent of the state's land surface owned by federal, state, and municipal governments, and almost all of that under some kind of protected status. (In contrast Great Plains states such as Iowa and Kansas have public land ownership of a few percentage points, and much of that in association with large federally constructed reservoirs.) California has an extraordinarily diverse set of habitats that range from temperate rain forests to both high and low altitude deserts, from high mountain ranges to the fertile Central Valley prairies, from oak savannas and chaparral to a coastline stretching more than 1500 kilometers. It has a correspondingly rich diversity of wild species, the highest number of species of any state in the U.S., and a highly diverse economy¹⁰. It is also home to the paradigmatic case of intensive industrialized agriculture, but the state also hosts a lively small farm sector with a substantial minority of farmers practicing organic and agroecological methods.

California also would seem in some places to represent an exceptional example of a rich, species favorable landscape mosaic. I live in the middle of an urban

¹⁰ California Dept. of Fish and Wildlife, *California Natural Diversity Database*.

area of 2.5 million people and, thanks to conservationist efforts, am able to observe beaver, coyotes, deer, river otters, eagles, wild turkeys, hawks, cranes, and herons, and a great variety of other wildlife species within a ten minute walk from my house. Sacramento's wildlife friendly parkway is based on 60 kilometers of the American river's course through the city that connects directly to rice fields in the downstream valley, some of which are farmed with production techniques specifically designed to support wildlife. Upstream, the parkway connects to orchards, vineyards, vegetable farms, and livestock ranches, maintaining a rich mixture of environments, some of which also are farmed with techniques developed to be relatively wildlife friendly, and whose foothill landscapes adjoin mountainous national forest land used for production forestry and a variety of other purposes. These forests include large officially designated wilderness areas where the legal standard excludes virtually all human economic other than backpacking. Such parkways are increasingly common in American cities, often based on abandoned railways, shipping canals, or irrigation facilities. (Relatively species-rich environments are also often created by forests maintained for watershed protection, as in Rio de Janeiro, Sao Paulo, Mexico City, New York, and the San Francisco Bay Area. When one conceptualizes such urban initiatives as complementary to efforts to make agriculture friendlier to biodiversity, as I believe most urban and rural environmentalists do, at least implicitly, a land-sharing viewpoint can gain the loyalty of a wider range of both rural and urban environmental groups.)

With more than fifty percent of its land under some kind of protected status and an exceptional diversity of species and environments, and many landscape patterns that would seem to represent very favorable conditions for the survival and migration of species, California would seem to constitute a model for species protection. And yet, it clearly does not represent such a model. Biologists have long considered it to be suffering from an extinction crisis. The overwhelmingly most important reason for that are the multiple effects of intensive, industrial agriculture. The rich perennial grass prairies of the state were quickly converted by early ranchers into species-poor annual grassland pastures and remain highly degradable. The most species rich portion of the state was converted to agriculture, and in the 20th century,

into a highly chemical dependent agriculture dependent on cultivation strategies resulting in high rates of soil degradation, including salinization. Nearly all the rivers of the state have been dammed to provide irrigation water for agriculture, and very secondarily, water for urban consumers. Intensive agriculture can be held responsible for high mortality and sometimes extinction of bird species and amphibian species and the decimation of the populations of various salmon, trout and other native fish species, now teetering on the brink of extinction. Even large mammal populations were severely affected, including large populations of elk and pronghorn antelope, both of which were largely eliminated in two decades after the Gold Rush—half a million Tule elk in the Central Valley in 1850 were so reduced in numbers that by 1870, the animal was thought to be extinct. Eventually a few survivors were found that have been carefully nurtured back to a population of over 5,000 in largely coastal protected areas, about 1% of the original population. Wolves were eliminated in the state, though one family has now migrated in from the north and is being carefully tracked.

Does the California case support a Half-Earth hypothesis about saving species, because it shows that fifty percent is not always an unreasonable goal for land under protected status and because it still hosts an amazing array of wild species and habitats? Or does it support a land-sharing point of view, because much of the remaining species richness is due to the creation of complex, anthropogenic landscapes that are still friendly to the survival of many species? Or, does it prove that a species-rich area that practices intensive agriculture will suffer high rates of species decline and extinction in spite of a high percentage of protected non-agricultural land?

A definitive answer to these questions based on scientific theory and data gathering is not currently possible and will not likely become so. The elements that must be considered are far too numerous and interact in myriad ways, many of them unknown or poorly understood by science. Historians are familiar with the difficulties of counter-factual historical analysis, and in this case, in which the story is one of several centuries of interaction between people and nature, these difficulties become overwhelming.

For those of us who argue for a land-sharing approach, the essential problem with the land-sparing perspective can be summarized in two related points: first, land-sparing strategies assume that protected areas are far more protective of a broad range of species than is or will likely be the case; and, second, the strategies assume that the negative effect of industrial agriculture on biodiversity is minimal and can remain so even under measures to increase production on a smaller land base. Both assumptions rest on an idea of control over landscape and habitat processes that is, from the land-sharing perspective, illusory. I argue here that this false sense of control over human life and ecological processes derives at least partially from a way of thinking shaped by imperialism.

In this paper, I do not intend to carry out yet another empirical study, nor to summarize and evaluate such competing studies. Insightful reviews of the growing literature have been undertaken in recent years. Rather, I lay out an admittedly sweeping and simplifying historical summary of the relation of the creation of protected areas and the development of styles of agricultural production. I argue that it is an essentially *imperial* imagination that has governed both the major developments in agricultural technologies and the creation of what have come to be called protected areas. In my historical survey, I mean to use the term “imperial” in a descriptive fashion without a necessary value judgment about the implications. In my conclusion, I briefly make the case for assigning the word “imperial” in a distinctly normative way that shows how an imperial view has shaped and conditioned our views of agriculture and species conservation in ways that stand in the way of understanding the problem and fashioning solutions.

IMAGINING, CONTROLLING, SETTLING, AND ORDERING IMPERIAL SPACE

At one time or another in the last five hundred years, most of the surface of the earth has come under European control or substantial influence. If we include Russia's eastward expansion and European influence in China, the area that has not experienced European re-ordering of one kind or another is extremely small. Some

imperial expansion was aggressive, as in most of the Americas and Africa, and as in North America, genocidal. In other cases, there were more subtleties and variation.

“THE IMPERIAL MIND” AS A SHORTHAND TERM FOR THE SAKE OF ARGUMENT

European conquest and subsequent settlement and use of the land certainly were not governed by any single policy or historical imperative. The use I make in this essay of the term “imperial mind” is a kind of shorthand used for summarizing overall approaches in the European conquest and occupation of land, shorthand that glosses over thousands of particular situations and circumstances.

I define the imperial mind or imperial imagination here as a perspective which lays out particular kinds of activities on landscapes—e.g., agriculture, industry, transportation, conservation—based on the ability and desire to shape those landscapes over extended periods of time consistent with expansion and maintenance of authority over those landscapes by centralized political authority. This contrasts with other historical processes that occur as the result of processes such as spontaneous migration of species, including human migration, driven by factors not under significant centralized planning or direction. For example, the eastward migration of European populations in the medieval period or the extensive pre-Columbian migration of North American tribal populations, all with characteristic ways of using and shaping landscapes, were not imperial in character. However, much of the settlement and use of landscapes in the European settlement of the Americas were to a large extent imperial in the sense that they derived from the increasing exercise of centralized authority established by the use of force and maintained by formal and informal institutions based on centralized authority. I posit that the imperial mind or imagination is one held by many people whose lives and perspectives have been shaped by imperial contexts, whether or not they possess actual imperial power.

Positing the existence of an imperial mind serves to shape a useful argument that emphasizes that the diversity of imperial initiatives and policies resulted in some general patterns that have a great deal of relevance for present-day debates over the

entwined topics of biodiversity conservation and agricultural development. And, obviously, far from exploring all the implications of the workings of the imperial mind, here I concentrate on those aspects most useful for exploring the relationship between biodiversity conservation and agriculture.

CONQUEST AND SETTLEMENT

In Mexico and Peru, the large populations and strong state organization of indigenous society, quickly undermined by Old World diseases and European exploitation of internal conflicts, led to relatively rapid processes of military conquest and establishment of European authority over large areas. The landscapes of these territories had been clearly shaped by human settlement and the Spanish task was to turn land and labor to the production of commodities with a high value in European markets.

A recent article by a group of scientists argues that population collapse led to generalized reforestation to the extent that the planet was significantly cooled as a consequence of Conquest¹¹. Unfortunately, such studies reinforce a simple equivalency between human population, total food production, and environmental degradation—an equivalency that takes our attention away from how economic activities are organized and carried out in a variety of cultures, historical eras, and locations, and for what purposes.

No serious student of Latin America history would readily accept this naively Malthusian argument, because Spanish and Portuguese land use constituted a vast rearrangement of land use patterns that by no means led to generalized reforestation. The introduction of European grazing animals meant that land previously devoted to agriculture as well as woodlands and forests were devastated by the “plague of sheep,” cattle, pigs, horses, and mules. Livestock provided not only hides and wool, but also traction for enormous mining enterprises and transportable food for labor pulled away from agricultural production. Mines, ships, ranching, and sugar operations consumed timber for structures and fuel at a pace that prompted only partially

¹¹ Alexander Koch et al., “Earth System Impacts of the European Arrival and Great Dying in the Americas after 1492,” *Quaternary Science Reviews* 207 (March 2019): 13–36, <https://doi.org/10.1016/j.quascirev.2018.12.004>.

successful imperial attempts at regulation to ensure sustained productivity. Animal drawn plows allowed land to be put into production in far more extensive agriculture than the relatively intensive land use in many indigenous areas. There undoubtedly were some areas where forests recovered from human pressures in this reshuffling of land uses, but we do not know very much about the balance of reforestation versus deforestation. We know that the protection of forests became a common concern of local communities as well as royal imperial officials but that no major reforestation took place¹².

In Brazil, in areas of economic interest to the Portuguese, Atlantic coast forests fell quickly to commercial interests. The hardwoods of the Brazilian coastal forests provided the initial economic incentives for possession of territory, and sugar plantations quickly followed. Sugar eliminated much of the Atlantic Coast forest by displacement as well as for firewood to fuel refineries. The search for firewood would extend well into the interior where sugar could not be grown. Other major commodities including cotton, tobacco, and cattle demanded more forest and brush land well away from the coasts. The coffee boom of the 19th century destroyed most of the Atlantic Coast Forest that remained, such that by the mid-twentieth century something more than ninety percent of the Atlantic Coast forest had been cut. The great imperative of the Portuguese empire and the nation state that replaced it was to incentivize effective occupation and economic use of a vast and varied territory. After the establishment of enormous land grants under the *sesmaria* system, one of the primary ways to establish a claim to land was to prove that the forest cover had been removed, establishing effective use, the fundamental basis for land ownership under the Portuguese regime. Large landholdings dominated the economic realm, consistent with establishing effective occupation and production of a small number of profitable commodities. Rather than numerous settlers, what was wanted were laborers, and Brazil thus became the most important destination for African slaves¹³.

We also know that in the grand rearrangement of the post-Conquest Latin American land use patterns, little or no thought was given to the general need to

¹² Shawn William Miller, *An Environmental History of Latin America* (Cambridge: Cambridge University Press, 2007); Elinor G. K. Melville, *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (Cambridge: Cambridge University Press, 1994).

¹³ Warren Dean, *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest* (Berkeley: University of California Press, 1995).

preserve species. The imperial mind was focused on maximizing production of a relatively narrow range of commodities and was quite comfortable with elimination or wholesale refiguring of peoples, cultivars, forests, water, and species in their landscapes. Remote areas often remained species rich simply because they were of little economic interest from an imperial point of view or because they presented serious barriers to European use and settlement, as in the case of the Amazon Basin.

In North America, the imperative for settlement was strong in early imperial policy, because in most regions there were relatively few possibilities for the rapid exploitation of the territory for commodity production comparable to gold, silver, and sugar in Latin America. However, as in Brazil, there were strong incentives for timber cutting, particularly for ship building in the colonies and in Europe. Deforestation enabled settlement by agriculturalists eager to establish relatively self-sustaining colonies, and it also enabled and was dependent upon conquest and decimation of Native American peoples. Trapping and trading for valuable furs spread European influence and disease deep into the continent well ahead of colonization. Colonists into the interior encountered an environment which, often unbeknownst to them, already had significantly reduced populations of wild species and humans.

Early ownership of land by colonizing groups was enabled by royal charters and colonial mandates, but with time land ownership fell under the control of speculative commercial claims in a dynamic relationship with effective use claims. Whether used by the imperial powers of England, Holland, France, and Spain, or whether by the new aggressively expansionist independent governments that followed, a variety of policy tools including everything from the effective use of claims of impoverished settlers, to vast speculative schemes, to warfare against native peoples and competing empires and nations were marshalled relentlessly in the pursuit of ownership and control.

By the late 18th century, commodity production of cotton and tobacco began to dominate southern regions of the North American continent, with effects similar to those of commodity production in Brazil and some other parts of Latin America. With remarkable speed, plantation owners used Native American and then African slavery,

as well as indentured servitude, to bring masses of laborers to work in predominantly large-scale enterprises, sanctioned by government policy.

In the 19th century, the settlement of the great plains of North America and the Southern Cone of South America turned what were highly species rich environments of the Americas into vast grain and legume producing regions, first to serve European and then later domestic American markets. Governments were highly efficient in eliminating native populations of the prairies through outright military actions and various forms of support for European settlers in killing and displacing indigenous populations. Governments provided generous support for railroad and highway construction and communications networks. Settlers were offered free land or land on advantageous terms, both of which led to widespread fraud, but also to rapid settlement and use of prairie lands. In Canada, the United States, and Argentina, conversion of species rich prairies to crop production was mostly accomplished in a matter of a few decades. The speed and thoroughness of this conversion, unprecedented in human history, were the results of essentially imperial conquest.

Without going into detail regarding a complex but fairly well-known process of conquest and settlement, this quick sketch serves to remind us of the fundamentally imperial and essentially commercial character of the transformation of the landscapes of the Western Hemisphere. While some historians may choose to quarrel over such a sweeping generalization, in this process of three centuries or so there was virtually no serious thought or effort given to the preservation of wildness nor of wild species. In both North and South America, as early as the end of the eighteenth century some royal and national officials as well as writers connected to the romantic and transcendentalist movements objected to the processes of wholesale destruction in both spiritual and economic terms, but these voices had very limited effect on the ground. To the contrary, as a practical matter, the determination to domesticate landscapes for human productive purposes and to either eliminate or exploit species was single-minded in the extreme¹⁴.

¹⁴ For a very early example of government officials and political thinkers making carefully constructed and supported arguments for protective conservation policies, see: José Augusto Pádua, *Um Sopro de Destruição: Pensamento Político e Crítica Ambiental No Brasil Escravista, 1786-1888* (Rio de Janeiro: Zahar, 2002); For perhaps the most important critic of reckless westward expansion of the United States in the 19th century see: Donald Worster, *A River Running West: The Life of John Wesley Powell* (Oxford: Oxford University Press, 2002).

The imperial mind attempts to cast a scheme of rule and exploitation over vast landscapes and diverse peoples in a way that will attempt to serve a distinctly limited set of purposes. It is imagined that there is a place for everything of value to imperial purposes and that everything can be put in its place. The literature on imperialism has made very clear how destructive this can be human society and culture, which are severely damaged when subjected to simplifying grand schemes. Until recently, we have paid less attention to how profoundly imperialist visions and strategies violate the biological dynamics and complexity of the planet¹⁵.

IMPERIAL PURPOSES AND BIODIVERSITY CONSERVATION

Whether in Europe or in Europe's colonial territories, the idea of pursuing human activities with a primary goal of preserving biodiversity is for the most part a very new phenomenon. Kings and nobility protected lands in European and other civilizations going back thousands of years, but they did not do so for the protection of the broadest possible array of species; rather, they sought to protect game species for their aristocratic enjoyment and prestige, and forest resources for future use. This sometimes resulted in protection for a much wider range of species, but this was almost never, if ever, the primary goal. In the 19th century, new or newly powerful national governments began to take over the deer parks of the nobility and to create new ones to promote economic growth and national prestige¹⁶.

Similarly, beginning in the nineteenth and early twentieth centuries, colonial governments and national governments of former colonial territories began to set aside protected areas that often had as a consequence a good deal of species protection. But while certain iconic species earned the attention of protection efforts, broad species protection was not on the agenda. The difference between pursuing species protection and pursuing other purposes of imperial occupation and settlement is far from trivial whether one considers intention or consequence.

¹⁵ James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1999). While Scott identifies the mentality I am discussing with the phenomenon of the state, I believe that his analysis applies even more strongly when discussing empires, and especially when the creation of states and empires are, in at least some sense, part of the same enterprise, as in the Americas. His view of industrial agriculture as one of those "certain schemes" is particularly appropriate to this paper.

¹⁶ Michael Williams, *Deforesting the Earth: From Prehistory to Global Crisis*. (Chicago: University of Chicago Press, 2003).

For example, the National Parks system of the United States, which until recently provided the highest level of protection available for land and wildlife, was created for several reasons that only incidentally protected anything but a handful of storied species. Railroad companies lobbied for National Parks that would promote mass tourism and thus sell train tickets and room reservations in large hotels often owned by the railroads themselves. Sublime peaks and waterfalls became symbols of national character associated with the task of what would become known as “nation building”¹⁷.

At the same time, state and federal policies encouraged the slaughter of bison, antelope, prairie dogs, bears, cougars, coyotes, and wolves—even offering bounties to hunters who worked steadily towards species extinction. Modern ecology teaches us clearly that the rapid decline of these large mammals necessarily meant corresponding declines in a wide variety of other unaccounted species, while some other species may have been favored.

Further, in many if not most cases, the creation of “natural parks” required the usually violent removal of indigenous peoples, which also had a variety of ecological effects in landscapes that had been shaped by human beings for millennia. We are just beginning to puzzle out what the direct ecological effects of these removals may have been. We are far from imagining, much less detailing, what must have been myriad other more subtle effects.

Citizens inspired by the very influential 19th century ideas of romanticism and transcendentalism lobbied for the protection of places that would inspire awe and pose a counterpoint to an otherwise shallow commercial and narrowly pragmatic culture—such lobbying usually focused on magnificent mountain, coastal, or waterfall features thought to inspire reflection and provide solace to the soul. The animals living there were at best appreciated as scenery and not primarily as ecological phenomena, and often the most magnificent places favored as parks were markedly poor in species in contrast to surrounding landscapes. Nationalists, railroad owners, and romantics were interested in salvaging the magnificent, but had relatively little

¹⁷ Donald Worster, “The National Parks,” in *Oxford Research Encyclopedia of American History* (Oxford University Press, 2016), <https://oxfordre.com/americanhistory/view/10.1093/acrefore/9780199329175.001.0001/acrefore-9780199329175-e-63?mediaType=Article>.

interest in saving a wide variety of species, most of which tended to avoid or did not thrive in the awe-inspiring but sparse landscape features of National Parks.

In the North America and parts of South America, the creation of the first national parks and an ethos to support them was contemporaneous in time and linked in various ways to the larger project of subduing, eliminating, and seizing the land of indigenous peoples. It is also remarkable that yearning for the transcendental, in the dominant imperial imagination of the day, saw little or no contradiction between the search for the sublime and the project of genocide. Even those who lamented the process of genocidal removal and warfare tended to see it as a tragic inevitability rather than a matter of serious contention.

As a particularly telling example, the protection of the sublime landscapes of California's high Sierras—the origin of the Sierra Club and an influential way of thinking about nature as a whole--and the later more extensive and more partial protection of California's mountain forests almost completely ignored the idea of preserving the vastly more species-rich landscapes of the foothills and valleys, which were profoundly transformed to make them suitable for farming and cities. What became Yosemite National Park was a partial exception, but an exception that tends to prove the rule. The valley floor of Yosemite was species rich. However, the relatively low altitude valley floor's value to the Park was appreciated largely as a place from which the visitor could gaze upward at mountain grandeur. The indigenous people who had treasured the valley for its species richness were removed violently or with the threat of violence. Then, species of the valley were poorly protected because of the intense tourist presence there¹⁸.

Elsewhere in California, rivers originating in mountain snowfall were resources to be dammed at the expense of huge populations of salmon while exotic shad and striped bass were deliberately introduced at the expense of at least dozens of native species. Hundreds of low mountain or foothill valleys resembling Yosemite Valley became species-poor reservoirs, stocked with often non-native species, and

¹⁸ Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks*. (Oxford: Oxford University Press, 2000).

managed in ways that discouraged the survival of many native species, including salmon.

Only in the 1980's did conservation officials in California begin to think about creating spaces that might protect valley and foothill species. When they did, they mostly did so under the prodding of the national and state endangered species acts passed in the 1970's, not because they suddenly realized that their predecessors had destroyed a great array of California species as they had successfully protected sublime but inanimate and mostly barren granite peaks. Some of the very recently protected valley areas are an improvement, but so small in area and so compromised in a variety of other ways as to be mere pathetic reminders of what was lost. The nearly complete dominance of industrial agriculture in the most species rich areas has made it politically impossible to create significant species protection where it might once have been most significant. Tiny relict portions of valley habitat have been set aside for protection of such charismatic species as the San Joaquin kit fox, but in absurd half-measures. Not only are the areas set aside far too small to ensure long range survival of the species, but the reserved land is mostly surrounded by chemically intensive agriculture that poses major and subtle threats to species on which the fox depends.

The powerful image of the alpine fly fisherman casting his line over a high mountain lake, an image used relentlessly to promote conservation causes, only began to seem a little foolish when in the late twentieth century it became recognized that such lakes surrounded by bare granite were woefully lacking in nutrients and therefore in naturally occurring trout. Trout were present mostly as varieties not found naturally in the high Sierras, placed in mountain lakes and streams by a state agency anxious to sell fishing licenses even though the planted fish wreaked general havoc on native amphibians, insects, and other species. The business of enjoying the idea of nature was not the same as the protection of nature¹⁹.

¹⁹ Roland A. Knapp, "Non-Native Trout in Natural Lakes of the Sierra Nevada: An Analysis of Their Distribution and Impacts on Native Aquatic Biota," *Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. III, Assessments and Scientific Basis for Management Options* (Davis, 1996), https://www.highsierrahikers.org/issue_fish_main.html.

The overwhelmingly largest extent of protected areas in the United States is not under the jurisdiction of the relatively protective National Parks Service, but, rather, is administered by the National Forest Service and Bureau of Land Management. Both were created in a sense of well-justified panic in the late nineteenth century as commercial firms had stripped the nation of most of its forests and wrought havoc on non-forested lands. The purpose of the Forest Service and Bureau of Land Management was distinctly not species protection, but rather resource conservation in the sense of promoting rational resource use for recovery and long-term economic use of the land and its resources²⁰.

Such agencies, backed by commercial enterprises, were aggressive in asserting that they were in the business of managing selected natural resources rather than in “merely” protecting them—simple protection of land and wildlife being seen as naïve and in any case lacking a viable political constituency. The management of the national forest was heavily influenced by the rise of so-called “scientific forestry” in Europe, often little more than a euphemism for transforming forests into species-poor tree farms. Not coincidentally, the Forest Service was made and remains part of the Department of Agriculture.

A young wildlife management specialist and Forest Service employee named Aldo Leopold realized that these agencies were actively hostile to anything remotely resembling an ecological perspective promoting broad species protection; his disillusionment inspired the essays in his ***Sand County Almanac*** that are often seen as the foundation of the modern environmental movement. It is expressive of the depth of the problem that it took some years of working in the field for the young scientist to realize that offering bounties for the killing of coyotes, cougars, and bears was a purely economic proposition and a very short-sighted one even in that context. It would take Leopold many years of thought and writing to argue that such policies were far removed from any genuinely ecological concerns capable of providing an enduring human economy, much less a species-abundant world²¹.

²⁰ Doug MacCleery, “Re-Inventing the USFS: Evolution from Custodial Management to Production Forestry to Ecosystem Management,” in *Re-Inventing Forestry Agencies Experiences of Institutional Restructuring in Asia and the Pacific*, ed. Patrick Durst et al. (Bangkok: FAO (Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific), 2008), <http://www.fao.org/3/AI412E06.htm>.

²¹ See esp. “Thinking Like a Mountain” and “A Fierce Green Fire,” both commonly published with the volume known as Aldo Leopold, *A Sand*

In the 1960's, as the views of Leopold and others like him began to sink in, significant areas were made wilderness areas which have the effect of affording high levels of species protection, but the areas have not been chosen primarily on the basis of overall species richness nor on particular species habitat. Most designated wilderness areas have been chosen for their political and economic availability for wilderness designation and for the remoteness and beauty of landscapes, not primarily for biological reasons. In 2008, a Forest Service analyst wrote that the long history of "resource management" had only slowly and very partially given way to an eco-system management perspective, one that might include species richness and species conservation as significant considerations. His well-supported view was that public lands agencies such as his own remain largely very resistant to habitat and species protection as primary goals, if for no other reason than the lack of a large and well-organized constituency necessary to force more significant change. In the present political climate, more than ten years after his assessment, there is even less political opportunity for an "ecosystem management perspective" that would give major consideration to species abundance per se²².

The small fraction of wildlands that has been in recent decades put into reserves intended primarily for broad species and habitat protection are usually severely compromised by their limited size and by competition with surrounding land uses. For example, the ambitious initiative to restore the Florida Everglades is often spoken of by biologists as though it is primarily intended for broad species and habitat protection. Historically, however, the initiative became possible only after cities committed to aggressive economic growth became convinced that the deteriorating state of the Everglades threatened future water supplies and thus commercial and residential expansion. Furthermore, despite this political foundation among powerful economic interests, the initiative is severely undermined by a handful of powerful sugar and vegetable growers and their allies among the more short-sighted residential and commercial developers²³.

County Almanac: And Sketches Here and There (Oxford: Oxford University Press, 1949).

²² MacCleery, "Re-Inventing the USFS: Evolution from Custodial Management to Production Forestry to Ecosystem Management."

²³ The National Academies of Sciences - Engineering - Medicine, *Progress Toward Restoring the Everglades: The Seventh Biennial Review* (Washington, D.C.: National Academies Press, 2018), <https://doi.org/10.17226/25198>.

Seen over the course of recent centuries, we can see the unfolding of a kind of imperial vision for non-European landscapes. Some of the elements of this vision occurred simultaneously, or nearly so, as military conquest, settlement, and economic exploitation spread across landscapes, opening frontiers and expanding territorial dominance. Once territorial consolidation and economic use of the landscape were firmly accomplished, the vision drew people's attention and government policy towards other concerns. Among these concerns was the creation of protected areas. Protected areas often provided very significant species protection, but only incidentally to other purposes, and therefore, in a very haphazard and impartial fashion.

If we move to the relatively species-rich areas of the tropics and sub-tropics, the history of setting aside "protected areas," is at least equally as problematic. In Africa, as we have noted elsewhere, the grand wildlife parks were mostly created as part of an imperialist agenda imposed on the species rich landscapes of indigenous people. The most active people promoting these parks were those interested in "big game hunting" and/or the control of diseases effecting cattle and people. As such, the areas selected were biased toward large, charismatic species. The creation of the parks was often severely harmful to the interests of local peoples who had little choice in the matter. While in many cases we can celebrate the fact that, given twentieth century human population growth rates and the destruction of native economies, these parks have provided very significant species protection that otherwise would not have occurred, such protected areas, as we have discussed, are immersed in controversy. Not coincidentally, they have also proved highly vulnerable to poaching and other forms of degradation. The creation of large new areas devoted to species protection strategies is extremely unlikely²⁴.

As we have noted, in Brazil and some other nations, "beginning in the late 1960's, extremely large protected areas have been created, partly because of the availability of immense virtual wilderness areas, but also for a variety of other reasons ranging from the commercial to the militarily strategic. The military government of Brazil began a massive expansion of protected areas, far more aggressive than the

²⁴ Perfecto, Vandermeer, and Wright, *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*, 79–81, 123–24.

effort to create national parks beginning in the 1930's, that envisioned perhaps the most ambitious program of species protection ever initiated by any government. While the military had a variety of motives for embarking on this program, it consulted heavily with biologists in determining areas boundaries considered optimal for species protection. These biologists applied the theory of island biogeography pioneered by E.O. Wilson and others to shape a species protection strategy consistent with its other purposes--political, economic, and military. However, it has been shown that island biogeography theory was in many respects a useful but inadequate guide to species protection, even where rigorously applied, essentially because of the simplifying assumptions inherent in the theory²⁵.

Later, civilian governments of Brazil created yet further enormous and numerous reserves, but many with other kinds of purposes, more aligned with the interests of indigenous and other forest peoples. Some of the largest of these reserves are governed by legislation that explicitly protects indigenous extractive and agricultural activity as well as such activities practiced by more recent settlers. These reserves constituted a deliberate attempt to move away from policies of straightforward exploitation and towards recognizing the actual or potential value of complex livelihood and use strategies that have been worked out over a long period of time by forest inhabitants, and included the simple recognition that the forest was not an uninhabited landscape. The reserves recognized the "nature's matrix" idea in their very conception, being examples of land sharing strategies. These reserves have been positive in many respects but have also been beset with failings and disappointments, such that a mere comparison of the military government's approach and that of later governments forces a recognition of all the limits of comparative studies of land sharing and land sparing practices as discussed at the beginning of this essay²⁶.

In contrast, in October, 2018, the newly elected President of Brazil, announced his intentions to reduce protection for land in the Amazon and the *cerrado* in favor of development of rapid extractive and agricultural activities. He has also announced his

²⁵ Ronald A. Foresta, *Amazon Conservation in the Age of Development: The Limits of Providence* (Florida: University Press of Florida, 1991).

²⁶ The literature on this topic is large and often highly polemical. For a useful review that recognizes the complexity of Brazilian forest protection types and strategies, and that is referred to by both land-sparing and land-sharing advocates to bolster their arguments, see: C. Nolte et al., "Governance Regime and Location Influence Avoided Deforestation Success of Protected Areas in the Brazilian Amazon," *Proceedings of the National Academy of Sciences* 110, no. 13 (March 26, 2013): 4956–61, <https://doi.org/10.1073/pnas.1214786110>.

intentions to declare the MST, the principal social movement advancing agroecological land sharing strategies, to be a terrorist organization whose members he promises to jail or exile. These measures clearly represent potential reverses for land-sharing strategies. But is this a victory for land sparing strategies because it means rapid expansion of intensive agriculture, or a defeat because it reduces the areas and levels of species protection? This dilemma reveals a fundamental problem for land sparing, because it demonstrates that developing agricultural frontiers in Brazil, the single most significant measure by which intensive agriculture in the world can be practically expanded, also represents the single largest threat to the most species-rich regions of the planet. The only more serious threat may be climate change, to which expansion of the industrial agriculture frontier contributes significantly. Further, it demonstrates that in practice those forces most active in promoting intensive agriculture are also those most determined to compromise protected areas. It also forces a consideration of the way the composition and motives of social actors must be considered as primary factors in evaluating the value of sparing versus sharing strategies²⁷.

The creation of new and significantly large protected areas will almost everywhere face strong opposition that in a post-imperial world will not be easily overcome. An apparent recent exception might be the vast new areas recently put into protected status in Chile and Argentina as a result of the initiative of American philanthropists. In fact, this expansion of protection across much of the Southern cone is not an exception. These sparsely populated areas were given national protected status only after decades of negotiation and compromise, with the explicit intention of both the Tompkins, the American philanthropists, and of the national government's long-standing policy goals that most of the ranching and farming activity in the region would be protected as such, just as the forests and plains of the region will be protected from excessive logging and destructive mining. The result will

²⁷ "Brazil's Jair Bolsonaro threatens purge of leftwing activists", *theguardian.com* Oct. 12, 2018; "Brazil's Bolsonaro plans threaten Amazon, experts say", *BBCNews* Oct. 31, 2018

again be a matrix of activities arising out of historical development as well as elements of conservation planning, precisely as we advocate here in the spirit of land sharing²⁸.

Land sparing advocates assume a degree of consensus and/or exercise of sheer political power that is unrealistic in the extreme. Their proposals for putting as much of half of the earth's surface in protected areas is simply unhinged from human history in general, but also from the history of conservation. It glosses over the fact that most of the approximately 15% of the land surface of earth that is in "protected" areas is everywhere protected in various very limited ways—the idea of just extending the fifteen percent to 30 percent, or even half of the earth's surface can only seem possible if one ignores not only political reality but also fails to deal with the restricted sense in which protected areas have been protected. Recent studies have shown that the goal, adopted as the "Aichi Target 11" by the United Nations and 190 national governments, of increasing terrestrial protected areas from 15% to 17% has fallen far short of its objective to actually protect biodiversity and landscapes through expansion of protected areas and in some cases had resulted in "perverse outcomes" due to political and managerial manipulations and failures. The study concluded that setting mere percentage values of surface covered was of "little conservation value"²⁹.

Just as important is the failure to recognize the effects of intensive agriculture outside field boundaries and across regions, as we have argued. Genetically modified corn and soy grown in the American Midwest reduce the butterfly populations that migrate to Mexico. Pesticides and fertilizers sharply reduce insect, amphibian, birds and other species populations far beyond the agricultural fields to which they are applied. They also create massive dead zones in coastal waters in roughly 400 known areas around the world, reducing marine populations including those valued for human food. It is notable that the large dead zone in the Gulf of Mexico has been shown after intensive study to be largely caused by fertilizer application and cultivation techniques in Iowa, more than a thousand kilometers upstream³⁰. Irrigation schemes have seriously compromised species survival around the world in myriad ways, some obvious and some subtly connected to the eco-system functions

²⁸ "With 10 Million Acres in Patagonia, a National Park System is Born", NYTimes Feb 19, 2018.

²⁹ Piero Visconti et al., "Protected Area Targets Post-2020," *Science*, April 11, 2019, eaav6886, <https://doi.org/10.1126/science.aav6886>.

³⁰ Perfecto, Vandermeer, and Wright, *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*, 57–58.

of rivers and streams³¹. Human-induced climate change is caused to some degree (in the range of 20-30%) by intensive agriculture though the effect could be reduced by a variety of agroecological strategies of the sort we propose for a species supportive landscape matrix. Agricultural intensification as it is commonly practiced and presumably accepted if not recommended by advocates of a land-sparing strategy can be expected to sharply intensify these ecologically destructive impacts. The chemical and fossil fuel intensity of modern agriculture must be seen as part of the problem, not part of the solution³².

Industrial agriculture relies almost everywhere on government policy and financial subsidies. It has progressed at the expense of indigenous peoples, smallholders, agricultural laborers, and the cultural milieu of small towns that supported them. The social base for this expansion has been large-scale corporate enterprise and finance capitalism. Our own historical work and that of many others have shown how industrial agriculture both arose from and promoted U.S. and European imperialism. That work also makes clear that the mentality of many scientists in agriculture and other fields have been shaped by the imperial context and imperial purposes³³.

Taken as a whole, the land sparing strategy arises from a false sense of power and control that that can be seen to have historically been based on the imperial enterprise. The strategy is based on the assumption that it is not only desirable but possible to vastly extend the reach and power of nation states against the interests of large populations. Protected areas are imagined, that to work as envisioned, must be utterly isolated from the real complexity of human society, as they are to be isolated from the actual dynamics of species populations moving across landscapes. Agriculture is imagined as an activity that may be practiced without important effects beyond field boundaries, despite a great body of scientific work that demonstrates

³¹ G. Grill et al., "Mapping the World's Free-Flowing Rivers," *Nature* 569, no. 7755 (May 8, 2019): 215–21, <https://doi.org/10.1038/s41586-019-1111-9>.

³² Sonja J. Vermeulen, Bruce M. Campbell, and John S.I. Ingram, "Climate Change and Food Systems," *Annual Review of Environment and Resources* 37, no. 1 (November 21, 2012): 195–222, <https://doi.org/10.1146/annurev-environ-020411-130608>; Angus Wright, *The Death of Ramón González: The Modern Agricultural Dilemma*, 2nd ed. (Texas: University of Texas Press, 2005).

³³ Vermeulen, Campbell, and Ingram, "Climate Change and Food Systems"; Wright, *The Death of Ramón González: The Modern Agricultural Dilemma*.

this to be false. Only a radically simplified view of both the requirements of species protection and the effects of intensive agriculture can support such a view.

The land-sparing vision of vast new protected areas complemented by a sacrifice zone of chemically intensive agriculture is an essentially imperialist vision both in its historical roots and in its present context. It seeks to lay across the earth an extremely simplified bi-polar scheme of complete protection on one hand and intense destruction on the other. While supposedly based on ecological expertise it in fact flies in the face of the much more complex view of a sophisticated ecological perspective. While supposedly based on hard-headed political realism, the land-sparing strategy is in fact based on a political fantasy which has no agent capable of carrying it out consistently and no significant human constituency outside of corporate and financial interests to support it. Conservationists who support it are likely to discover that even where they succeed in expanding “protected” areas the effects of industrial agriculture will fatally undermine their efforts. The willingness of many corporate agribusiness interests to support this nominally ecological strategy is based on the desire to continue the expansion of a kind of agriculture that is fatal to biodiversity and a stable world climate.

In contrast, the land-sharing vision does not rely on a totalizing dichotomy that obliterates ecological and cultural complexity. It seeks to combine pragmatically possible increased levels of “protection” for non-agricultural landscapes with a transformation from industrial agriculture to more ecologically based agricultural techniques, most of which have been shown to be both practical and productive. It is not a grandiose plan but an approach to problems and opportunities. It seeks to work within the framework of complex landscapes and complicated politics. Its social base, as briefly discussed above, does not wield the raw power of agribusiness interests relied upon for the land-sparing strategy, but in contrast relies on an rapidly expanding and diverse array of rural and urban people and organizations more consistent with environmental and democratic values. Rather than seeking to eradicate complexity, it seeks to work within continually evolving local, regional, and global situations.

Within the contrasting views are contained not simply scientific disagreements but a range of philosophical and political value choices. While we can continue to try to assess the degree to which these contrasting views work to protect biodiversity in practice, the land-sparing vision's realization can only really be assessed on its own terms once we have carried out a kind of one-time experiment on a planetary level. The land-sharing approach can never be expected to demonstrate total success, but neither will it carry such a high risk of irreversible failure.

REFERENCIAS

- Dean, Warren. *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest*. Berkeley: University of California Press, 1995.
- Foresta, Ronald A. *Amazon Conservation in the Age of Development: The Limits of Providence*. Florida: University Press of Florida, 1991.
- Grill, G., B. Lehner, M. Thieme, B. Geenen, D. Tickner, F. Antonelli, S. Babu, et al. "Mapping the World's Free-Flowing Rivers." *Nature* 569, no. 7755 (May 8, 2019): 215–21. <https://doi.org/10.1038/s41586-019-1111-9>.
- Knapp, Roland A. "Non-Native Trout in Natural Lakes of the Sierra Nevada: An Analysis of Their Distribution and Impacts on Native Aquatic Biota." *Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. III, Assessments and Scientific Basis for Management Options*. Davis, 1996. https://www.hightsierrahikers.org/issue_fish_main.html.
- Koch, Alexander, Chris Brierley, Mark M. Maslin, and Simon L. Lewis. "Earth System Impacts of the European Arrival and Great Dying in the Americas after 1492." *Quaternary Science Reviews* 207 (March 2019): 13–36. <https://doi.org/10.1016/j.quascirev.2018.12.004>.
- Kremen, Claire. "Reframing the Land-Sparing/Land-Sharing Debate for Biodiversity Conservation." *Annals of the New York Academy of Sciences* 1355, no. 1 (October 2015): 52–76. <https://doi.org/10.1111/nyas.12845>.
- Leopold, Aldo. *A Sand County Almanac: And Sketches Here and There*. Oxford: Oxford University Press, 1949.
- MacCleery, Doug. "Re-Inventing the USFS: Evolution from Custodial Management to Production Forestry to Ecosystem Management." In *Re-Inventing Forestry Agencies Experiences of Institutional Restructuring in Asia and the Pacific*, edited by Patrick Durst, Chris Brown, Jeremy Broadhead, Regan Suzuki, Robin Leslie, and Akiko Inoguchi. Bangkok: FAO (Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific), 2008.

<http://www.fao.org/3/AI412E06.htm>.

- Melville, Elinor G. K. *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico*. Cambridge: Cambridge University Press, 1994.
- Miller, Shawn William. *An Environmental History of Latin America*. Cambridge: Cambridge University Press, 2007.
- Nolte, C., A. Agrawal, K. M. Silvius, and B. S. Soares-Filho. "Governance Regime and Location Influence Avoided Deforestation Success of Protected Areas in the Brazilian Amazon." *Proceedings of the National Academy of Sciences* 110, no. 13 (March 26, 2013): 4956–61. <https://doi.org/10.1073/pnas.1214786110>.
- Pádua, José Augusto. *Um Sopro de Destruição: Pensamento Político e Crítica Ambiental No Brasil Escravista, 1786-1888*. Rio de Janeiro: Zahar, 2002.
- Pearce, Fred. "Sparing vs Sharing: The Great Debate Over How to Protect Nature," 2018. <https://e360.yale.edu/features/sparing-vs-sharing-the-great-debate-over-how-to-protect-nature>.
- Perfecto, Ivette, John Vandermeer, and Angus Wright. *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*. 2nd ed. London: Earthscan Publications Ltd., 2019.
- Scott, James C. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press, 1999.
- Spence, Mark David. *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks*. Oxford: Oxford University Press, 2000.
- The National Academies of Sciences - Engineering - Medicine. *Progress Toward Restoring the Everglades: The Seventh Biennial Review*. Washington, D.C.: National Academies Press, 2018. <https://doi.org/10.17226/25198>.
- Vermeulen, Sonja J., Bruce M. Campbell, and John S.I. Ingram. "Climate Change and Food Systems." *Annual Review of Environment and Resources* 37, no. 1 (November 21, 2012): 195–222. <https://doi.org/10.1146/annurev-environ-020411-130608>.
- Visconti, Piero, Stuart H. M. Butchart, Thomas M. Brooks, Penny F. Langhammer, Daniel Marnewick, Sheila Vergara, Alberto Yanosky, and James E. M. Watson. "Protected Area Targets Post-2020." *Science*, April 11, 2019, eaav6886. <https://doi.org/10.1126/science.aav6886>.
- Williams, Michael. *Deforesting the Earth: From Prehistory to Global Crisis*. Chicago: University of Chicago Press, 2003.
- Wilson, Edward O. *Half-Earth: Our Planet's Fight for Life*. Norton: Liveright, 2016.
- Worster, Donald. *A River Running West: The Life of John Wesley Powell*. Oxford: Oxford University Press, 2002.

---. "The National Parks." In *Oxford Research Encyclopedia of American History*. Oxford University Press, 2016.
<https://oxfordre.com/americanhistory/view/10.1093/acrefore/9780199329175.001.0001/acrefore-9780199329175-e-63?mediaType=Article>.

Wright, Angus. *The Death of Ramón González: The Modern Agricultural Dilemma*. 2nd ed. Texas: University of Texas Press, 2005.

El espíritu imperial y la conservación de la biodiversidad: perspectiva histórica sobre los debates actuales en conservación de la biodiversidad

RESUMEN

Los recientes debates sobre conservación de la biodiversidad pueden ser resumidos en la expresión "tierra escasa versus tierra compartida". En el campo de la tierra escasa se ubican aquellos que defienden políticas que permitan incluir tanta superficie dentro de la categoría de "áreas protegidas" como sea posible, lo que virtualmente excluye la agricultura como actividad posible dentro de esos espacios. Para asegurar la adecuada producción de alimento, las tierras por fuera de esas áreas protegidas deberían ser cultivadas con máxima intensidad a través de técnicas que excluyen o exterminan las poblaciones de flora y fauna silvestre. En contraste, aquellos que abogan por las políticas de tierra compartida defienden la combinación de áreas protegidas con paisajes agrícolas, los cuales deben usar técnicas para favorecer las poblaciones silvestres dentro de una compleja matriz mixta de usos de suelo. Sostengo que el intento por resolver el debate a través de estudios que buscan cuantificar la producción agrícola y el incremento de poblaciones silvestres en los paisajes existentes tiene un valor limitado porque no es posible controlar apropiadamente la variación temporal y espacial. El problema fundamental alrededor de la evaluación cuantitativa, que exploro en detalle en este artículo, es que las dos posiciones de políticas defienden visiones del mundo profundamente diferentes en términos filosóficos, las cuales pueden ser comprendidas a través del análisis histórico de la formación de las prácticas y las ideas de conservación colonial y postcolonial. Aquí, argumento que el problema esencial con la perspectiva de "tierra escasa" se puede resumir en dos puntos relacionados: primero, esas estrategias asumen que las áreas protegidas protegen a un rango de especies mucho más amplio del que realmente cubren, y segundo, asumen que los efectos negativos de la agricultura industrial sobre la biodiversidad son mínimos y esta puede permanecer uniforme bajo estrategias que incrementen la producción sobre la base de áreas más pequeñas. Ambos supuestos yacen en una idea, históricamente construida, de control del paisaje y de procesos del hábitat que es, desde la perspectiva de tierra compartida, una ilusión. Este falso sentido de control sobre la vida humana y los procesos ecológicos surge, al menos parcialmente, de una forma de pensamiento moldeada por el imperialismo. Para ello, presento una perspectiva histórica sobre los debates contemporáneos de la conservación, con énfasis en el desarrollo de las políticas en Brasil, América Central y Estados Unidos.

Palabras Clave: Biodiversidad; Conservación; Historia Ambiental; Agricultura.

Recibido: 16/12/2020
Aprobado: 18/02/2020